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CHALLENGES TO A CIRCULAR ECONOMY – THE PRESENCE OF IMPURITIES IN WOOD WASTE FOR RECYCLING

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The need for a circular economy has gained large importance and is considered one of the top priorities in the Sustainable Development Goals (SDG) formulated by the European Union (EU) [EC, 2015]. In this context, material recycling of post-consumer waste is seen as the preferred option to high value discarded items. However, one of the challenges to the circular economy is the presence of impurities within the recyclables. Indeed, impurities could re-enter the product's life cycle along with the targeted material (risk-cycling). Therefore, information on levels of impurities in recyclable waste fractions is needed to quantify and address the problem. Among recyclable fractions, wood waste occurs in large amounts from applications such as packaging, buildings, construction, demolition, and furniture. The main end of life option for wood waste has historically been incineration, due to its high calorific value. However, cascading the resource's uses is necessary in order to apply a circular economy approach and extend the product's life cycle. Therefore, recycling is the preferred treatment option for post-consumer wood waste, which is generally chipped and processed to produce particleboard. Since wood waste is often associated with material and chemical impurities [Krook et al. 2004; Krook et al, 2006; Edo et al., 2016; Augustsson et al., 2016], investigations are needed to ensure high quality, clean and safe recycling loops.

The aim of this study is to evaluate levels of material and chemical impurities in post-consumer wood waste from a recycling perspective.

Data on composition of impurities within wood waste come from a sampling campaign from recycling centers in Denmark. Material impurities were investigated, and were found to account up to 22% of the collected material. Concentration levels of selected chemical elements and persistent organic pollutants were analysed. Their concentration appeared to vary according to application use of the waste wood, being generally higher for wood waste from the demolition and the furniture sector. The presence of chemical contaminants was linked to material impurities as well as to treatment of the wood items with preservatives, paints, and finishes. Results were used to investigate the consequences that presence of such impurities have on recycling chain of wood waste.

The presentation will address preliminary findings from presence of material and chemical impurities in the wood waste as a basis to frame the challenge that risk-cycling may constitute to a (almost) closed circular economy.

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